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NUREMBERG

THE CASTLE OF NUREMBERG.

The town of Nuremberg, or Nürnberg, in Bavaria, though fallen from its ancient wealth and consequence, and become, in a commercial sense, a dull and unattractive spot, will nevertheless be pleasing to the traveller of taste, and will fully repay the attention he may be induced to bestow on its examination. In former days it was one of the most flourishing towns included in the Hanseatic league, and was reckoned among the most wealthy of the free Imperial cities. It was the residence of emperors, the seat of diets, and, before the trade with the East Indies took a new direction, the focus of commerce between Asia and Europe. Nor were these its only advantages: the manufactures of Nuremberg were long and justly celebrated, and brought a large accession of wealth to the town. Various mathematical and musical instruments were invented, and the first pocket-watches made in that town. The manufacture of these articles, as well as of hardware of all kinds, and toys of brass and wood, caused Nuremberg to be highly celebrated. The trade in such wares is still very considerable, and, owing to the cheapness of the toys in particular, half the children in Europe are supplied with playthings, called Dutch toys, from that source. These toys are chiefly made by the peasants of the Thuringian forest, who employ themselves and their families on such labours during the winter, and by their simple and frugal habits, are able to produce them at a surprisingly low price. For the sale of Nuremberg wares an annual fair is held, at which much business is transacted. Yet, compared with its ancient traffic—so extensive as to give rise to the proverb,

> Nuremberg's hand
> Goes through every land,—

the present trade of Nuremberg may be called trifling, as the condition of the city is also greatly altered.

The outward aspect of Nuremberg has not partaken much of the decay which has fallen on its commercial interests, and it is in the appearance of the city, as it stands surrounded by feudal walls and turrets, and inclosed within arched gates, with massive cylindrical watch-towers, that the traveller may recognise its ancient grandeur and strength; while, as he examines the quaint buildings of the city, and wanders through its irregular streets, he may fancy himself carried back to a distant century. Most of its churches are in a state of beautiful preservation, and have escaped in a manner that seems almost miraculous, the storm of regular warfare, and the outbreaks of mistaken zeal. The principles of the Reformation were early embraced by the inhabitants of Nuremberg; but the churches were not, as in too many other instances, despoiled of their architectural embellishments. The private dwellings, many of them of a palace-like extent, and built of stone, are likewise in excellent preservation, and are in some instances still inhabited by the families whose forefathers originally constructed them.

Nuremberg is celebrated as the birth-place of Albert Dürer, called the Raphael of Germany; of the famous

sculptor Peter Vischer, the poet Hans Sachs, and the gallant knight Beham, the friend of Columbus.

St. Sebald's church, a very beautiful Gothic edifice, contains the master-piece of art, of which Germany is justly proud, the *Shrine of St. Sebaldus*, executed by Peter Vischer, after a design by Albert Dürer. The sculptor, assisted by his five sons, spent thirteen years of labour on this work, and completed it in 1519. It is a miniature Gothic chapel in bronze, consisting of a rich fretwork canopy, supported on pillars. The figures of the Apostles occupy twelve niches around the shrine, and, for their grace, expression, and varied action, are justly extolled by every person conversant with fine sculpture. Above these are twelve smaller figures of Fathers of the Church, and, scattered around, among foliage and flowers, are about seventy fanciful representations of mermen, animals, &c. The relics of the saint are enclosed in an oaken chest, encased in silver, which is most elaborately worked in bas relief. Finally, at that end of the shrine which faces the altar, is an admirable statue of the artist himself, in a mason's dress, with apron on, and chisel in hand; and at the opposite end a figure, equally excellent, of St. Sebald. The same church also contains "The Descent from the Cross," painted by Albert Dürer.

The church of St. Lawrence is considered to be the finest church in Nuremberg. It is of a noble Gothic architecture, and is very rich in decorations. The windows are exquisitely painted, and one of them, the Volkamer window, for the depth and brightness of its colours, and the excellence of its design, is said to be scarcely equalled throughout Europe. This church contains the celebrated *Sacrament-hauschen*, or tabernacle for the reception of the sacramental wafer, delicately executed in the form of a spire, of Gothic open-work, by Adam Kraft; the whole of the exquisite stone structure, which tapers to the height of sixty-four feet, is supported by three figures, representing himself and his apprentices.

The castle of Nuremberg occupies the most northern and elevated position within the town. It is of great antiquity, so that no precise date can be assigned for its erection. It is built on a rock of red stone, unlike any other found in the country, and tradition attempts to account for this in the same way that it explains many other curious facts, by attributing it to the work of a magician. The rock and castle, say the superstitious of Nuremberg, were both transported from the neighbourhood of the Rhine in one night. This edifice towers above all the other buildings, and commands the best view of Nuremberg, and of the country around. It appears to have received few modern additions, and is therefore interesting as a specimen of the ancient style. The emperors of Germany made the castle of Nuremberg at various periods their residence: they took pleasure in the prosperity of the city, knowing its importance, and they found its situation, nearly in the centre of their dominions, well adapted for their convenience. The imperial regalia were deposited in the chapel of the Holy Ghost for nearly three centuries, but are now removed to Vienna. The castle has two towers, supposed to be of extreme antiquity, the Pentagonal tower, and the Heathen tower, so called from some carved figures upon it, said to be idols. It also contains two very remarkable chapels, one supported by low and thick arches, and assigned to the tenth century; the other, or upper chapel, resting on slight marble pillars, with Corinthian capitals, and also very ancient. The Corinthian pillars, says tradition, were brought from Rome by the evil one, who had laid a wager with the almoner that he would carry them in less time than mass could be performed. Three pillars were safely deposited, and the spirit had just arrived at the chapel with the fourth, when he found the clerk putting out the candles, and mass concluded. This put him in such a fury, that he dashed the pillar to the ground, and broke it in two pieces. Lest any one should presume to doubt the truth of the story, the fractures are shown where the pillar was cemented together, and an image of the devil's head is fixed in the wall facing the door of the chapel.

Briefly to notice some of the other public buildings of Nuremberg, the *Rath-haus*, or town-hall, is one of the finest in Germany. It is built in the Italian style, and contains, among other curiosities, a number of paintings, some of which are by Albert Dürer, and have suffered much by time, having in some cases been injudiciously restored. In the upper story of the Rath-haus is a singular representation, in stucco, of a tournament held there in 1434, the figures as large as life.

The church of St. Ægidius is a handsome modern building, in the Italian style. It succeeded a chapel originally founded in 1140 for some Scotch Benedictine monks. This church contains a fine altar-piece, representing Christ lying dead in the arms of the Virgin, by Vandyke. Near this church stands the gymnasium, or high school, founded by Melancthon, whose statue is erected in front of it.

The church-yard of St. John deserves to be mentioned, as having been the burial-place of many noted persons. There are about three thousand grave-stones in this church-yard, all regularly numbered, and mostly decorated with bronze plates, bearing coats of arms, and devices of deceased patricians. No. 649 is Albert Dürer's grave, No. 503 Hans Sachs', a celebrated cobbler and poet, whose poems, mostly of a satirical sort, exceed six thousand in number. Sandrach and Adam Kraft also lie interred here. This burial-place is situated about a mile from the town; and between it and the town gate are stationed, at regular distances, seven stone pillars, each bearing a representation, in bas-relief, of a scene in the passion of our Saviour. These pillars were set up, according to tradition, by a citizen of Nuremberg, named Martin Ketzel, as a representation of the Dolorous Way, in Jerusalem, along which our Saviour is supposed to have passed, in going from Pilate's house to Calvary.

There are many well-conducted public institutions in Nuremberg, such as a polytechnic institution, a gymnasium, numerous schools, a society for the encouragement of manufactures, &c. The public paper, called the *Nuremberg Correspondent*, is one of the most widely-circulated in Germany. At one period, the proprietor, editor, and printer were all females.

We will conclude our notice of this city by mentioning the date of the most important inventions ascribed to its inhabitants. The first watches (called Nuremberg eggs) were made by Peter Hele in 1500; the gun-lock by a person not known, about 1517; the air-gun by Lobzinger, in 1560; the clarionet by Christopher Denner, in 1690; wire-drawing machine by Rudolph, in 1360; brass by Erasmus Ebner, in 1550.

OLD ENGLISH NAVIGATORS.

For Britons, chief,
It was reserved, with star-directed prow,
To dare the middle deep, and drive assured
To distant nations through the pathless main.
Chief, for their fearless hearts the glory waits,
Long months from land, while the black stormy night
Around them rages, on the groaning mast
With unshook knee to know their giddy way;
To sing, unquelled, amid the lashing wave;
To laugh at danger. Theirs the triumph be
By deep Invention's keen pervading eye,
The heart of Courage, and the hand of Toil,
Each conquered ocean staining with their blood,
Instead of treasure, robbed by ruffian war,
Round social earth to circle fair exchange,
And bind the nations in a golden chain.—THOMSON

As the naval glory of England, whether in the sad necessity of war, or in the laudable endeavour to promote

the operations of commerce and geographical science, must be a subject of interest generally to the inhabitants of the British islands; and as maritime discoveries, like other achievements of the human race, have, under the guidance or permission of Providence, progressed gradually, some notice of the lives of those eminent individuals who, in former days, contributed to the establishment of British credit on the highway of the seas, may be generally acceptable. We propose, therefore, to devote a series of articles to the lives of the old English navigators,—men who have so largely contributed to the civilization of the human race by rendering easy and familiar the passage of the ocean, which, up to the beginning of the fifteenth century, was, very generally regarded with those feelings which guided the pen of an old writer in the following passage:—

The ocean, (he remarks,) encircles the ultimate bounds of the inhabited earth, and all beyond it is unknown. No one has been able to verify anything concerning it, on account of its difficult and perilous navigation, its great obscurity, its profound depth, and frequent tempests; through fear of its mighty fishes, and its haughty winds; yet there are many islands in it, some of which are peopled, and others uninhabited. There is no mariner who dares to enter into its deep waters; or if any have done so, they have merely kept along its coasts, fearful of departing from them. The waves of this ocean, although they roll as high as mountains, yet maintain themselves without breaking; for if they broke, it would be impossible for a ship to plough them.

CABOT.

The history of this great navigator has been so much clouded in obscurity or misrepresented, that it would appear at first sight doubtful, whether we should put Cabot at the head of the naval worthies of *our* country; but the prominent parts of the following narrative will, we trust, satisfy the reader that we are justified in the course which we have taken.

Sebastian Cabot, the subject of this narrative, was the son of John Cabot, or Gabotto, as his name is sometimes found written. The elder Cabot was undoubtedly a native of Venice, who frequented England on commercial affairs; but little more is known of him than that he was a wealthy, intelligent merchant, and fond of maritime discovery. When his business caused him to sojourn in this country, his residence was at Bristol, where Sebastian was born in the year 1477. The young Cabot was early instructed in geography, navigation, and mathematics. When only nineteen years of age, he was included with his two brothers in a patent, dated 5th of March, 1496, and granted by Henry the Seventh to John Cabot, his father, for the discovery and conquest of unknown lands. The object of this expedition seems to have been, to find out new countries in a north-westerly direction, and above all, a shorter and more convenient passage to the East Indies.

It is remarkable, as showing the zeal and enterprise of these navigators, that this expedition, consisting of five ships, was equipped at the sole expense of the adventurers, which was probably the reason why these mariners did not set sail till the spring of the following year. The ship which the Cabots sailed in, was equipped at Bristol, and named "the Matthew." On the morning of the 24th of June, they first saw the coast of North America, probably the part now called Labrador, about 56° N. It does not appear that there is any farther account of this discovery; but it seems probable that the expedition returned to England immediately, in order to re-visit the newly discovered countries, with more definite objects of trade and empire.

In the privy purse expenses of Henry the Seventh is found a very curious item,—"10th August, 1497: To hym that found the new Isle £10." This isle is supposed to be Newfoundland, which is to the south-east of Labrador. This seems probable; for in another patent, granted to John "Kabotto," he is permitted to take six ships in any haven of the realm, of the burden of 200 tons and under, "to convey and lede to the Londe and Isles of late founde by the seid John, in owre name, and by our commaundemente," &c. At this time Sebastian seems to have been esteemed as the most scientific navigator of the family. When, about this period, the great discovery of Columbus began to be talked of in England, as a thing almost more divine than human, the effect of it upon young Cabot's imagination was to excite "a mighty longing," to use his own words, "and burning desire in his heart that he too should perform some illustrious action." For some reason or other the elder Cabot did not head the expedition just referred to; but it devolved on Sebastian, whose progress in naval science, aided by his father's example and instruction, had been very great. Our mariner, at this time, could not have been more than twenty-two years of age. About this time, *i.e.*, in 1499, John Cabot died; but there is no record of his death, nor is anything whatever known of Sebastian Cabot for the next twelve years.

In making the voyage above referred to, Cabot sailed from England in the summer of 1498, and directing his course by Iceland soon reached Newfoundland, which he called *Terra de Baccalhaos*, or land of cod-fish, from the great quantity of that sort of fish found there.

Of this remarkable voyage a short account is preserved by Peter Martyr, the historian of the New World, a writer of high authority, and an intimate friend of the navigator, who, at the time he wrote, was in the habit of paying him frequent visits at his house.

Martyr tells us that the northern seas, between Europe and America, were navigated and explored by Sebastian Cabot, who fitted out two ships in England at his own cost, and with three hundred men directed his course so far towards the North Pole, that, even in the month of July, he found great heaps of ice swimming in the sea, and almost continual daylight. In our summer the sun does not set at the North Pole for several months together; which curious fact is illustrated and explained in a Supplement on Astronomy, in a former part of this work [No. 411].

Martyr goes on to say that Cabot saw the land cleared of ice, which had been melted by the heat of the sun; and, seeing such masses of ice drifting down before him, he was compelled to turn his sails, and follow the west, then coasting still by the shore, he was brought far into the south by reason of the land bending so much southward. As he passed along the coasts, called by him *Baccalhaos*, he affirmed that he found the same current of the waters towards the west, which the Spaniards met with in their southern navigations, with the single difference that they flowed more gently. To account for the phenomenon of the waters of the ocean moving westward, which was of course first observed in the Atlantic, Martyr conceived that there must exist between the Old and New Hemispheres of the globe, certain great gaps or open places, through which the waters continually pass from east to west. The cause of this natural phenomenon, however, Cabot was expected to elicit;—the question at issue being simply this:—Why the seas in that part ran with so swift a current from the east to the west?

Our more advanced knowledge of physical geography and astronomy enables us to explain the phenomenon just referred to. The principal currents are produced by the movement of the waters, perpetually setting from the polar regions towards the equator, and by the progression of the tropical seas towards the west; both of which are occasioned by the earth's rotation on its axis. By the laws of mechanics, any fluid body in rotation has a tendency to accumulate in a heap at the part in most rapid motion; and accordingly, we find the waters of the polar circles naturally flowing from their own stiller region, to that of the more rapidly revolving equatorial zone Strong currents are thus formed, which, in some

instances bear with them vast masses of ice. These are carried to a greater or less distance, according to local circumstances. Now the water which arrives among the equatorial regions from the north, has not a rotatory motion of equal velocity with that of this portion of the globe; and consequently, it has an *apparent* motion from east to west.

Martyr informs us that at Newfoundland, the cod-fish, which the navigators took for tunnies, were so numerous, that they actually impeded the sailing of the ships! The inhabitants of those regions were found covered with the skins of beasts; but yet, not without the use of reason. He also relates that there are plenty of bears in those parts which feed upon fish. It is the habit of these animals to throw themselves into the midst of the shoals of fish, and seizing their prey, to bury their claws in their scales, drag them to land, and there devour them. On this account, he says, these bears seldom disturb men.

After sailing down southward with a view to a passage to the Indies, and discovering the coast of Florida, Cabot returned home, chiefly through want of provisions. Soon after the death of Henry the Seventh, he was sent for by Ferdinand, king of Spain, in which country he arrived in September, 1512, and immediately received the title of Captain, with a liberal salary. It appears from Spanish authorities, that Cabot had felt disgusted with the want of consideration shown him in England; but this seems to have been mainly owing to the civil disturbances in England, and the preparation for war with Scotland.

In the year 1515, Cabot was appointed to revise the maps and charts in use among Spanish navigators: he was also preferred to the station of member of the council of the Indies. He was also selected to conduct an important expedition for making new discoveries towards the west; but this plan was interrupted by the king's death. The new king of Spain, Charles the Fifth, was occupied elsewhere, and did not reach Spain for some time, during which the court was a scene of abominable intrigue. Fonseca, the enemy of Columbus, was in authority, and the insults offered by him and his creatures to Cabot, caused the return of the latter to England. In 1517 he was employed by Henry the Eighth, in connexion with Sir Thomas Perte, to make another attempt at a north-west passage. In this voyage he seems to have reached lat 67½° N., and to have entered Hudson's Bay, and given English names to many places therein. From this expedition he was obliged to return sooner than he intended, through the malice or timidity of Sir Thomas Perte, and the mutinous conduct of his crew.

After this voyage Cabot again visited Spain, where he was named, by Charles the Fifth, Pilot Major of the kingdom, and entrusted with the duty of examining all projects of voyages of discovery. The Molucca islands, in the Eastern Archipelago, at this time very much engaged the attention of mankind. The pope had presumed to give away the newly discovered countries of the world between Spain and Portugal; and the latter power having earnestly represented that the limits, assigned to her by the pope in his division of the New World, would include the Moluccas, it was resolved that a solemn conference should take place, in which all parties should state their claims, and experienced men should attend for the purpose of reference. At the head of this list was Cabot, and Ferdinand Columbus, son of the great navigator. The conference was held at Badajoz, in April, 1524, and by the end of May, sentence was pronounced that the Moluccas were within the Spanish division of the world. The Portuguese retired in disgust, and threatened an expedition to destroy any Spanish or other vessels trading within the disputed territory. Immediately after the decision, a company was formed at Seville to prosecute the trade to the Moluccas, and Cabot was appointed to the command of the first expedition sent out by the company. Unfortunately, the officers under Cabot were personally hostile to him. The expedition set sail in April, 1526, and proceeded to cross the Atlantic. On the Brazilian coast, a daring mutiny, excited by his officers, compelled him to resort to the extremity of putting on shore the three ringleaders, who were actually the persons named to succeed him in command, in case of his death. Cabot explored the river La Plata and some of its tributaries, erected forts, and endeavoured to colonize the country. He sent to Spain, and solicited the permission of the Emperor Charles to effect his object; as also a supply of ammunition, provisions, &c., which request was favourably regarded.

Another expedition arrived in the Plata in the subsequent year, commanded by Diego Garcia. After some disputes with Cabot, Garcia quitted the country, but left behind him some of his followers, who were guilty of acts which incensed the natives. In consequence, the whole nation burst with fury on the feeble colony, and Cabot was compelled to put to sea. He returned to Spain in 1531, where he resumed his old office, and made several other voyages. In 1548 he resolved to return to his native country.

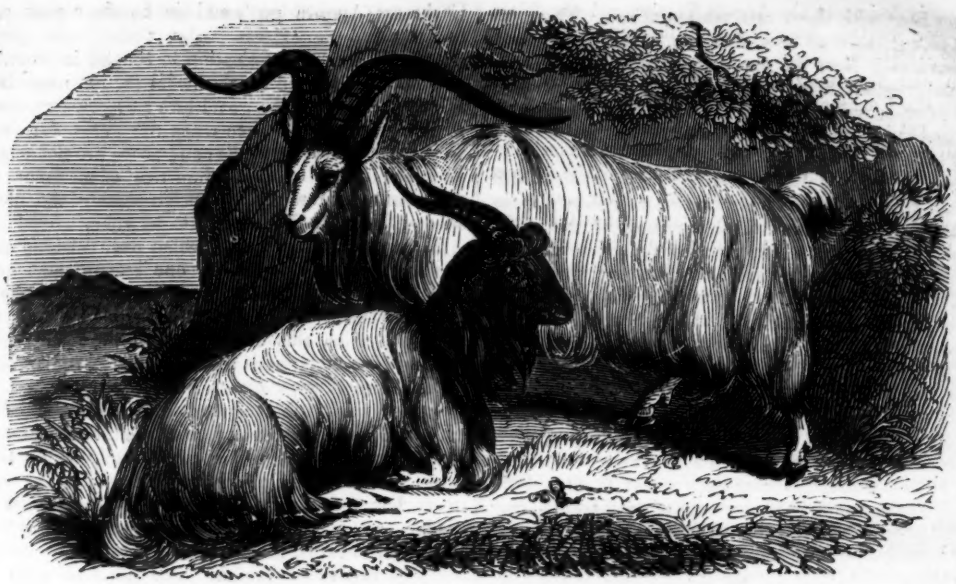
The throne of England was then filled by Edward VI., who, being very solicitous about maritime affairs, conversed with Cabot, and received from him some explanation about the variation of the compass, first noticed, or at least first particularly attended to, by our navigator. Edward granted him a pension of 250 marks a year (166*l.* 13*s.* 4*d.*),—a munificent reward in those days, and deservedly bestowed. He also made him Pilot Major of the kingdom. Cabot remained high in the young king's favour, and was consulted in all affairs relating to trade and navigation. The advice and influence of Cabot in directing an expedition to the north, opened to England the valuable trade with Russia: he was made governor of the company of merchant-adventurers, by whom the expedition was fitted out; and the instructions delivered by him to the commander, Sir Hugh Willoughby, evince good sense, knowledge, and humanity.

The journal of Stephen Burroughs, who was despatched as commander of a vessel in the Russian trade, in the year 1556, shows the character of Cabot in a very favourable light. Speaking of a visit to the vessel at Gravesend, before her departure, he says,—"the good olde gentleman, Master Cabota, gave to the poore most liberall almes, wishing them to pray for the good fortune and prosperous successe of the Serchthrift, our pinnesse."

In the reign of Mary, the maps and documents of Cabot were consigned to the custody of one William Worthington, who was associated with him in his pension in the year 1557. It is supposed that all Cabot's nautical papers were by these means either destroyed, or put into the possession of Philip of Spain, the husband of Mary: certain it is, however, that they are no longer to be found.

The time and place of Cabot's death are not known; although his friend Eden gives some account of it. Speaking of a mode of finding the longitude, he tells us, "Cabot, on his death-bed, tolde me, that he had the knowledge thereof, by divine revelation, yet so that he might not teache any man." We are told, however, by Eden, that he thought that "the good old man in that extreme age somewhat doted, and had not yet, even in the article of death, utterly shaken off all worldlye vaine glorye."

FAME, fame; thou canst not be the stay
Unto the drooping reed,
The cool fresh fountain, in the day
Of the soul's feverish need;
Where must the lone one turn or flee?
Not unto thee, oh! not unto thee.—MRS. HEMANS.



CASHMERE SHAWLS.

II.

Attempts to introduce the Cashmere Goat and the Shawl Manufacture into England.

The Cashmere goat is not confined particularly to the valley of Cashmere; but is found in various parts of Central Asia, between the Himalaya mountains and the Black Sea. The principal points in the most approved breeds of the Cashmere goat are large ears, slender and cleanly-formed limbs, horns slightly twisted, and, above all, a long, straight, silky, white fleece. The quantity of the down procured by each goat does not exceed a few ounces in weight; so that the cost of shawls manufactured from this substance must ever be high.

In a former article we gave an account of the mode in which shawls are manufactured in Cashmere from goat's down, as also a few particulars respecting the goat itself. We will now detail the circumstances under which attempts have been made to introduce this source of individual wealth into England.

In the year 1828, a gold medal was presented by the Society of Arts to C. T. Tower, Esq., of Weald Hall, Essex, for having reared a flock of Cashmere goats, and having had a shawl manufactured from their down, and on that occasion a paper, published by the Society, furnished some interesting facts on this subject. Unsuccessful attempts had been made in former years by two or three persons to obtain, through British interest in India, a few of the Cashmere goats, in order to ascertain whether the breed could be naturalized in this country, and the gold medal of the Society had, for some years, been offered with the same view, in order to keep the public attention fixed on the subject. It is to France, however, that we owe the first successful attempt to bring over the goats to Europe, and to rear them. Two agents, MM. Fernaux and Jaubert, were sent out by the French government, about twenty years ago, to Persia, for the purpose of making purchases of goats in the north-eastern provinces of Persia, and bringing them to Europe. A considerable number of these animals was procured, and although many of them died in their long and wearisome march to the Black Sea, and in their passage thence to France, yet a certain number survived, and were brought to Paris in the year 1823.

Mr. Tower, happening to be in Paris at the time of the arrival of the goats, succeeded in purchasing four of them, two males and two females, and in conveying them safely to his residence in Essex. In the park at Weald Hall the animals continued in health, and multiplied steadily, the number having increased to twenty-seven by the year 1828. The goats showed no impatience of cold, and were very healthy, requiring only the occasional shelter of a shed in very rough weather. In spring, summer, and autumn, they grazed like sheep, and were fed during winter with hay and refuse vegetables from the garden; but their favourite food was the *gorse*, (*Ulex Europæus*,) which they devoured eagerly, without being annoyed by its prickles.

The coat produced by these goats is a mixture of long coarse hair and of short fine down. The down begins to be loose early in April, and is collected easily and expeditiously by combing the animals two or three times with a comb such as is used for dressing horses' manes. A good deal of the long hair comes off at the same time, but this is afterwards carefully separated. The down produced by a male is about four ounces, and of a female two ounces. Two pounds of down, as it comes off the goat's back, is estimated as sufficient to make one shawl, fifty-four inches square, and it will therefore require ten goats, male and female, to furnish materials for one shawl. Mr. Tower, in 1828, had three shawls made of the down produced by his goats, the yarn being spun by Messrs. Pease, of Darlington, and the shawls being woven by Messrs. Miller and Sons, of Paisley. One of these shawls was examined by the Committee of Manufacture, of the Society of Arts, and was found to be superior to others made of the French shawl-goat down, taken from the progeny of the goats brought over from Persia. This shawl, together with a pair of the goats, were subsequently presented by Mr. Tower to his late Majesty, King William the Fourth, as a memorial of the success which had attended this attempt. In the year 1833 Mr. Tower, in a letter to the Society of Arts, speaks of the progress of his flock in the following terms:—

As to my flock of goats, I have to report most favourably of its increase in point of numbers, and good condition. I have now upwards of fifty, and should in fact have had considerably above sixty, had I not lost ten or a dozen early last summer, from the injudicious supply given to them, in my absence from home, by the party attending them, of large quantities, which proved too succulent, and caused a loss to the above extent, by diarrhœa. The very small produce of the pure Thibet wool rendered it almost hopeless (as the quantity has not been found to be increased in this country) that they could be made to pay as an article of profit. When it is considered, however, that the first crop of the Angora quintuples the quantity, and promises rather to improve the adaptation of it to the manufacture of shawls,

we have only to import the Angora females, and the object is attained, whether for cultivation in this country, or export to Australia.

From the foregoing details we may gather, that although the Cashmere goat appears able to thrive in England, yet the small quantity of down yielded by each goat will render the manufacture unprofitable as a commercial speculation. We turn, therefore, to the subject alluded to in the last sentence of Mr. Tower's letter.

Mr. Riley, a gentleman many years resident in New South Wales, directed his attention to the best means of establishing a growth of fine wool in that country; and in pursuance of this object he transported to that territory, in the year 1825 and 1828, two flocks of the finest Saxon sheep procurable in Germany. The result proved favourable, for the wools of New South Wales, derived from those flocks, became eagerly purchased by manufacturers who were able to appreciate their excellence. Encouraged by this success, Mr. Riley next contemplated the introduction into the colony of the Cashmere goat, anticipating a result both favourable to himself and ultimately advantageous to the country generally. The son of this gentleman thereupon directed his attention towards the purchase of some of the Cashmere goats which were known to be then existing in France, the result of the mission of MM. Ternaux and Jaubert.

Mr. Riley, on inspecting the flock of Cashmere goats under the care of M. Ternaux, found that the quantity of down on each goat was so extremely small—not averaging above three ounces—that he deemed the animal wholly unfit for the object in view. The project of sending over some of these goats to Australia was therefore abandoned. Mr. Riley, however, was recommended to visit the flock of M. Polonceau, at Versailles, a gentleman who has succeeded in introducing an important improvement in relation to this subject. M. Polonceau was among the first to purchase a chosen selection of the Cashmere goats brought over by Ternaux; and having accidentally seen an Angora goat whose hair had an extraordinary silky appearance, resembling long, coarse, but very soft down, the idea struck him that from these two varieties of goat there might result a third variety possessing in many respects the joint qualities of the other two. The Angora goats were a peculiar breed introduced into France a few years after the introduction of the Cashmere goat. M. Polonceau made the necessary arrangements for testing the correctness of the idea which he had formed; and he had soon the pleasure of seeing springing up around him a little progeny of Cashmere-Angora goats, whose coats contained a considerable quantity of long, fine, soft, and glossy down, in every respect fitted for the purposes of shawl-weaving. In 1826, the Société Royale et Centrale d'Agriculture de Paris, acquainted with the intesting result of M. Polonceau's flock, being at that time in the third generation; and considering that the down of this new race was more valuable than those of the East, and that it was the most beautiful filaceous material known, as it combines the softness of Cashmere with the lustre of silk, awarded him their large gold medal.

M. Polonceau sold four of his goats to the King of Wirtemburg, for the sum of 3400 francs; but as he was not willing at that time to dispose of any more of his flock, Mr. Riley returned to England without effecting any of his projected purchases. At a subsequent period, however, this gentleman succeeded in obtaining from M. Polonceau ten female and three male Cashmere-Angora goats, which were safely conveyed to England for shipment to Australia. We believe those animals were forwarded to their Eastern destination; and that it was intended, not only to rear this valuable variety of the goat, but also to produce another variety, intermediate between, or combining the joint properties of the Cashmere-Angora goat, and the common goat of Australia.

Mr. Riley's communication to the Society of Arts, at the time he received a gold medal for his importation of the Cashmere-Angora goats into this country was made we believe about the time when the goats were about to be shipped off to Australia; and as we are not acquainted with the result of this interesting experiment, we will state briefly a few particulars respecting the down, resulting from M. Polonceau's experience.

M. Polonceau has goats which have yielded as many as thirty ounces of down in one season, and he states that the whole of his herd produce on an average from twelve to twenty ounces each, thus showing the great advantages which this breed has over the pure Cashmere, which never yield more than four ounces, and frequently not more than two ounces of down per goat. M. Polonceau states that the Cashmere-Angoras are more robust and more easily nourished than the common goat, and that they are less capricious and more easily conducted in a flock. They prefer the leaves of trees, as do all other goats, but they thrive either on hay or straw, or green fodder, or in meadows. They also feed with equal facility on heaths, and on the most abrupt declivities, where sheep would perish. For the first year or two of M. Polonceau's experiment he thought it prudent to give them aromatic herbs from time to time, but he afterwards deemed a continuance in that course unnecessary. During the course of six or eight years he could never discover any particular disease to which the goats were liable, for they continued in robust health.

The down commences to grow on the goat's back in the month of September, and developes itself progressively until the end of March, when it ceases to grow, and detaches itself naturally, unless artificially removed. To collect the down, M. Polonceau waits for the period when it begins to detach itself, and then the locks of down which separate from the skin with little force are taken off by hand. The down is taken from the animals every three or four days. In general it first begins to fall from the neck and shoulders, and in the following four or five days from the rest of the body. The collection is completed in the space of eight or ten days: sometimes the entire down can be taken off at one time, and almost in an unbroken fleece. The whole of it can also be removed from the animal at one shearing when it begins to loosen. The shearing has the advantage of preserving more perfectly the parallelism of the individual filaments, which much increases the facility of combing and preparing the down for manufacture.

Both as regards England, considered as a manufacturing country, and Australia, as a country whose resources are only just beginning to be developed, we deem the further prosecution of the experiments briefly detailed above to be a matter of considerable importance, and well worthy of the attention of those who are favourably placed for prosecuting them.

WE are but too apt to consider things in the state in which we find them, without sufficiently adverting to the causes by which they have been produced, and possibly may be upheld. Nothing is more certain than that our manners, our civilization, and all the good things which are connected with civilization, have, in this European world of ours, depended for ages upon two principles; and were indeed the result of both combined; I mean the spirit of a gentleman and the spirit of religion. The nobility and the clergy, the one by profession, the other by patronage, kept learning in existence even in the midst of arms and confusion, and whilst government were rather in their causes than formed. Learning paid back what it received to nobility and priesthood, and paid it with usury, by enlarging their ideas, and by furnishing their minds.—BURKE.

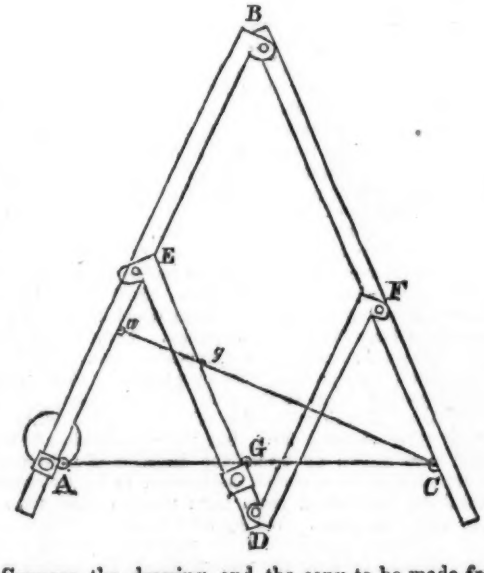
THE PANTOGRAPH.

THE Pantograph is an ingenious and useful instrument, employed by architects, draughtsmen, surveyors, and others, for copying drawings, either on the same scale as the original, or in any given proportion to it, larger or smaller.

If we have a representation—say, of a building; and wish to make another copy of it on a separate piece of paper, and on a similar scale, we can do so by the aid of ordinary drawing instruments, such as a scale of inches and parts of an inch, a pair of compasses, a protractor or sector for measuring angles, a parallel-ruler, a square, &c. But, when a copy is to be made, for instance, only one-half or one-fourth the size of the original drawing, the difficulty becomes much increased, because every line, long or short, vertical, horizontal, or diagonal, must be reduced in the just proportion. It is to meet such cases as these, that the instrument called a PANTOGRAPH has been invented; its name is derived from the Greek, and implies a *universal describer;* and we proceed to the principle on which this instrument acts.

AB, BC, DE, DF, (fig. 1,) are, respectively, four straight rods, jointed or hinged together at the corners in such a manner as to form a parallelogram, BFDE, all the angles of which are capable of altering with a very slight moving force. The joints are made with great care, in order that one ruler or rod may slide round on the other with ease and regularity. In instruments of the best construction, there is a small metal cock screwed to the lower bar of each joint, which supports the upper end of the axis upon which it turns.

Fig. 1.



Suppose the drawing, and the copy to be made from it, to occupy separate pieces of paper: then the two papers are laid flat down on a table, side by side, and the instrument is made to traverse the surface of both of them; a pointed tracer being made to pass over and along every line in the original draught, and a pencil being at the same time employed in drawing similar lines on the copy-paper. The intention of the instrument, then, is to produce lines, by the pencil, exactly similar in position, and bearing a certain fixed proportion, to the lines followed by the tracer. These purposes are effected in the following ingenious manner.

At the point C, in the bar BC, is fixed a small tube, intended for the reception of a tracer or tracing-point; the tracer being so fitted into the tube as to move freely within it, but without shaking. The bars AB and DE are each provided with tubes, shaped somewhat similar to that at C, but attached to a little apparatus which is capable of sliding along the bar, and of being screwed firmly to it at any desired part of its length. The difference between the tube at C and those at G and A is, that the former is for the reception of a tracing-point, and each of the latter for the reception of a pencil; also, that the former is fixed, while each of the latter is moveable along the bar to which it belongs. The pencil, placed in one of the tubes G, A, has frequently a little cup at the top, for the reception of weights to keep the pencil down upon the paper when the instrument is in use. The circular piece seen at A is a flat leaden weight with a brass stem rising from it, which fits in the tubes, in the same manner as the pencil or the tracing-point. This leaden weight has three or four fine points on its under surface, to keep it from shifting upon the paper: and under whatever tube it is placed, it forms a fulcrum, round which the whole instrument moves. The little weights in the cup at the top of the pencil keep the latter pressing down upon the paper, in a position to make a pencil mark whenever the instrument is moved; but, whenever it is desired to lift the pencil from the paper, it can be effected by the following means:—A silk cord is attached to the pencil stem, carried through eyes made for the purpose at the joints E, B, and F, and fixed in a notch at the upper part of the tracer; so that when the silk cord is pressed down by the thumb, the pencil is immediately lifted from the paper.

Such being the arrangement of the instrument, let us assume that the drawing is to be copied on the same scale as the original, all the lines of the one being of the same length as the corresponding lines of the other. Then, the point C, where the tracer is placed, being permanent, the two tubes A and G are slid along their respective bars until the points A, G, and C are all in a straight line, and the distance AG is equal to the distance CG, that is, until the tube G is exactly midway between A and C. The pencil is then fixed in the tube A, and the leaden weight is attached to the tube G. In this mode of arrangement, every part of the instrument revolves round G as a centre, the tracer C passing in contact with the lines of the drawing, and the pencil passing over the paper which is to receive the copy. Then whatever line the tracer C be made to pass over, the pencil at A will make a similar and equal line. That the line will be equal is demonstrable from the mathematical construction of the instrument; for, if the line BE be in the first instance equal to DE, and DE be equal to BF, then BEDF is a parallelogram, and will remain so, however the four angles may be altered. In our diagram B and D are acute angles, and EF obtuse; but, if the reverse of this were the case, the whole figure would still form a parallelogram. Neither is it necessary that all four sides should be of equal length; for if *opposite* sides are equal, *i.e.*, BE equal to DF, and DE equal to BF, the parallelogram will still be preserved. It would be somewhat tedious to follow out the mathematical reasoning by which it is shown that the lines drawn by the pencil are equal in length to those gone over by the tracer; but it will not be difficult for a reader, who knows a little of geometry, to trace the consequences, first, of the parallelism of the opposite bars of the frame BEDF, and, secondly, of the position of the fulcrum G, half-way between the tracer C and the pencil A.

In the next place, we will assume that the copy is to be exactly one-half the dimensions of the original drawing. The arrangement of the instrument will then be such as is represented in our diagram, where the leaden weight, which constitutes the fulcrum—or rather indicates the position of the fulcrum—is attached to the arm AB at the point A, instead of being attached at G. The fulcrum and the pencil have, in fact, changed places, without any change being made in the relative distances of A from G, and of G from C. The instrument, turning

round A as a fulcrum, leads to this necessary result, that the point G, to which the pencil is attached, moves through only one half of the space which the point C traverses in consequence of the distance being only half as great from A as C is from A. Whatever length of line, therefore, the tracer C passes over, the pencil G will describe a line of just half that length. Here, then, the required effect is produced; for the maintenance of parallelism in the opposite bars is just as certain here as in the former case; and the copy resulting from the action of the instrument will exactly resemble the original, on a scale one-half the size. It is necessary to observe, however, that, when the pencil is between the fulcrum and the tracer, as in the present instance, the copy is seen in the right direction or position; but, when the fulcrum is between the pencil and the tracer, as in the former instance, the copy is reversed, the right hand side of the original being represented at the left hand side of the copy, and *vice versâ*.

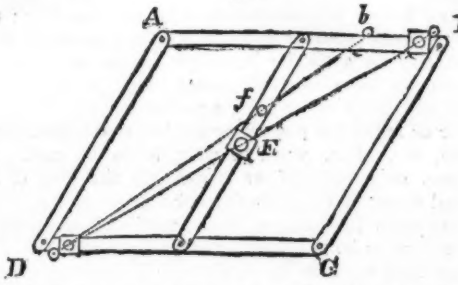
As a third example of the action of the instrument, let us suppose that the copy is to be on a scale only one-fourth of that of the original; in such case the pencil G will still be between the fulcrum and the tracer, but both pencil and fulcrum will be moved and adjusted to different positions on the bars to which they respectively belong. The adjustment must be such, that while C, *g*, and *a*,—the tracer, the new position of the pencil, and the new position of the fulcrum,—are all in a right line, the distance from *a* to C shall be four times as great as the distance from *a* to *g*; or, which amounts to the same thing, the pencil shall be only one-fourth as far distant from the fulcrum as the tracer is. Bearing in mind what has been before stated, it will be understood that all the lines which are drawn by the pencil will now be just one-fourth of the length of the corresponding lines in the original.

Any other proportion may be chosen in a similar way, and the instrument adjusted to that proportion by this formula;—As the distance of the pencil from the fulcrum is to the distance of the tracer from the fulcrum, so is the size of the copy to that of the original. But in using the pantograph it is seldom necessary to make any calculation in this respect; for the arms to which the pencil and the fulcrum are attached are so graduated as to comprise all the proportions likely to be required in practice.

The instrument is supported on six castors, one under each joint, which move freely over the surface of the paper, and give the joints a facility of adjusting themselves to the motion of the pencil. But, however carefully the instrument may be made, it is difficult to use, on account of these numerous joints and castors, which, while they make the instrument heavy for the hand, also render it difficult to mark the minute and gently curving lines, which often require to be copied.

To remedy in some respects these defects, a pantograph has been constructed of the form represented in the annexed cut (fig. 2.) Here we see five bars, moving freely on each other by means of six joints. F is the fulcrum, attached to the central cross-bar, and capable of sliding along it to any one of a scale of divisions engraved on the bar. D is the tube which carries the tracer, and B a moveable tube carrying the pencil. Then, supposing a copy has to be made the exact size of the original, the fulcrum is screwed down exactly at the centre of the cross-bar, as in the diagram; and the pencil B is so adjusted that D F and B shall all be in one straight line. The construction of the instrument involves, as a consequence, that the fulcrum will be exactly midway between the other two points; and, as a second consequence, that the lines drawn by the pencil shall be just as long as those gone over by the tracer. If the copy is required to be only half as large as the original, the fulcrum F is slid up to *f*, twice as far from the bottom of the bar as from the top; and when the pencil B is adjusted to the position *b*, where it will be in a right line with D and *f*, then the distance *f b* will be equal to one-half the distance *f* D, and the lines of the copy will be only one-half as long as the corresponding lines of the originla.

Fig. 2.



It is obvious at a glance that this instrument is more simple in its construction than the former, principally from the circumstance that the fulcrum is always attached to the central bar. When the copy is to be of the same size as the original the fulcrum is fixed midway between the tracer and the pencil; when it is to be larger than the original, the fulcrum is to be nearer to the tracer than to the pencil; when smaller than the original, the fulcrum is to be nearer to the pencil than to the tracer.

Our home is not in this mortal clime.
Our life hath not its bounds in time;
And death is but the cloud that lies
Between our souls and paradise.

MANY persons deprecate the study of the older authors on scientific subjects, as a waste of time and mental energy. To a certain extent, this is correct. To seek in them for that knowledge which they had no means of attaining, would be obviously absurd. No one expects to find a microscopical description of the tissues of the organized body before the era of the invention of that instrument. But it will often occur that men of original views suggest thoughts which they have no power of following out,—which, are, in fact, in advance of their time; and these may be profitably taken up at a subsequent period. Moreover in those departments in which the phenomena are constantly presenting themselves to inspection, an acute observer will frequently seize almost intuitively the essential details, and transmit to posterity accounts of them which may be highly valuable as bases for further inquiries. Thus the descriptions of diseases, founded on symptoms alone, left us by Hippocrates, were probably not surpassed by those of any other physician down to the time of Sydenham; and the descriptions of various species of animals, including not merely their external form, but their internal structure, which were drawn up under the direction of Aristotle, if not actually by him, would, if attended to by subsequent naturalists, have saved them from many errors, some of them egregious ones. We by no means recommend the study of bygone authors to those who desire merely to acquaint themselves with the present state of the science they are pursuing; since to them it would be generally a misemployment of time. But on those who are pursuing the path of original inquiry in any department upon which the means of investigation were within the reach of their predecessors, we would urge a careful research into their contributions, whether of fact or opinion, as a matter of interest as well as of duty. They will frequently thus be able to start from a more advanced position; they will often receive valuable assistance in their progress; and, when they have completed their work, they will be able to reply more successfully to the attacks of those who represent their discoveries as "nothing new."—*British and Foreign Medical Review.*

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